

SEQUENCE LISTING

<110> Morris, Peter
Stiefel, Thomas
Voelter, Wolfgang
Welters, Peter

<120> Recombinant Mistletoe Lectins

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<140> 09/601,667
<141> 2000-10-06

<150> PCT/EP99/00696
<151> 1999-02-03

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Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln Ser Thr Ile Pro Val Ser
35 40 45

Asp Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Xaa Asp
50 55 60

Ser Xaa Thr Ala Ala Ile Asp Val Thr Asn Xaa Tyr Val Val Ala Tyr
65 70 75 80

Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala
85 90 95

Glu Thr His Leu Phe Thr Gly Thr Thr Arg Xaa Ser Ser Leu Pro Phe
100 105 110

Xaa Gly Ser Tyr Xaa Asp Leu Glu Arg Tyr Ala Gly His Arg Asp Gln
115 120 125

Ile Pro Leu Gly Ile Xaa Gln Leu Ile Gln Ser Val Xaa Ala Leu Arg
130 135 140

Xaa Pro Gly Gly Ser Thr Arg Xaa Gln Ala Arg Ser Ile Leu Ile Leu
145 150 155 160

Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp Arg
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Leu Arg Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro Asn Gln Met
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Trp Leu Pro Val Xaa
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Tyr Phe Arg Phe Ile Thr Leu Leu Arg Asp Tyr Val Ser Ser Gly Ser
20 25 30

Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln Ser Thr Ile Pro Val Ser
35 40 45

Asp Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Xaa Asp
50 55 60

Ser Xaa Thr Ala Ala Ile Asp Val Thr Asn Xaa Tyr Val Val Ala Tyr
65 70 75 80

Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala
85 90 95

Glu Thr His Leu Phe Thr Gly Thr Thr Arg Xaa Ser Ser Leu Pro Phe
100 105 110

Xaa Gly Ser Tyr Xaa Asp Leu Glu Arg Tyr Ala Gly His Arg Asp Gln
115 120 125

Ile Pro Leu Gly Ile Xaa Gln Leu Ile Gln Ser Val Xaa Ala Leu Arg
130 135 140

Xaa Pro Gly Gly Ser Thr Arg Xaa Gln Ala Arg Ser Ile Leu Ile Leu
145 150 155 160

Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp Arg
165 170 175

Xaa Arg Gln Xaa Ile Asn Ser Gly Xaa Ser Phe Leu Pro Asp Xaa Tyr
180 185 190

Met Leu Glu Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val Gln
195 200 205

His Ser Thr Asp Gly Val Phe Asn Asn Pro Xaa Arg Leu Ala Ile Xaa
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Xaa Gly Asn Phe Val Thr Leu Xaa Asn Val Arg Xaa Val Ile Ala Ser
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Leu Ala Ile Met Leu Phe Val Cys Gly Glu Arg Pro Ser Ser Ser
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Arg Xaa Gly Met Xaa Val Asp Val Arg Asp Asp Asp Phe His Asp Gly
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Asn Gln Ile Gln Leu Trp Pro Ser Lys Ser Asn Asn Asp Pro Asn Gln
35 40 45

Leu Trp Thr Ile Lys Arg Asp Xaa Thr Ile Arg Ser Asn Gly Ser Cys
50 55 60

Leu Thr Thr Tyr Gly Tyr Thr Ala Gly Val Tyr Val Met Ile Phe Asp
65 70 75 80

Cys Asn Thr Ala Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Xaa Asn
85 90 95

Gly Thr Ile Ile Asn Pro Arg Ser Asn Leu Val Leu Ala Ala Ser Ser
100 105 110

Gly Ile Lys Gly Thr Thr Leu Thr Val Gln Thr Leu Asp Tyr Thr Leu
115 120 125

Gly Gln Gly Trp Leu Ala Gly Asn Asp Thr Ala Pro Arg Glu Val Thr
130 135 140

Ile Tyr Gly Phe Arg Asp Leu Cys Met Glu Ser Asn Xaa Gly Ser Val
145 150 155 160

Trp Val Glu Thr Cys Xaa Ser Ser Gln Xaa Asn Gln Xaa Xaa Trp Ala
165 170 175

Leu Tyr Gly Asp Gly Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys
180 185 190

Leu Thr Xaa Gly Arg Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser
195 200 205

Cys Ser Xaa Xaa Ser Xaa Xaa Gln Arg Trp Val Phe Thr Asn Glu Xaa
210 215 220

Ala Ile Leu Asn Leu Lys Xaa Xaa Xaa Xaa Xaa Asp Val Ala Gln Ala
225 230 235 240

Asn Pro Lys Leu Arg Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro
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Asn Gln Met Trp Leu Pro Val Xaa
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 Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln Ser Thr Ile Pro Val Ser
 35 40 45
 Asp Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Gly Asp
 50 55 60
 Ser Ile Thr Ala Ala Ile Asp Val Thr Asn Leu Tyr Val Val Ala Tyr
 65 70 75 80
 Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala
 85 90 95
 Glu Thr His Leu Phe Thr Gly Thr Thr Arg Ser Ser Leu Pro Phe Asn
 100 105 110
 Gly Ser Tyr Pro Asp Leu Glu Arg Tyr Ala Gly His Arg Asp Gln Ile
 115 120 125
 Pro Leu Gly Ile Asp Gln Leu Ile Gln Ser Val Thr Ala Leu Arg Phe
 130 135 140

Pro Gly Gly Ser Thr Arg Thr Gln Ala Arg Ser Ile Leu Ile Leu Ile
 145 150 155 160
 Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp Arg Ala
 165 170 175
 Arg Gln Tyr Ile Asn Ser Gly Ala Ser Phe Leu Pro Asp Val Tyr Met
 180 185 190
 Leu Glu Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val Gln His
 195 200 205
 Ser Thr Asp Gly Val Phe Asn Asn Pro Ile Arg Leu Ala Ile Pro Pro
 210 215 220
 Gly Asn Phe Val Thr Leu Thr Asn Val Arg Asp Val Ile Ala Ser Leu
 225 230 235 240
 Ala Ile Met Leu Phe Val Cys Gly Glu Arg Pro Ser Ser Ser Asp Val
 245 250 255
 Arg Tyr Trp Pro Leu Val Ile Arg Pro Val Ile Ala Asp Asp Val Thr
 260 265 270
 Cys Ser Ala Ser Glu Pro Thr Val Arg Ile Val Gly Arg Asn Gly Met
 275 280 285

Cys Val Asp Val Arg Asp Asp Asp Phe His Asp Gly Asn Gln Ile Gln
290 295 300

Leu Trp Pro Ser Lys Ser Asn Asn Asp Pro Asn Gln Leu Trp Thr Ile
305 310 315 320

Lys Arg Asp Gly Thr Ile Arg Ser Asn Gly Ser Cys Leu Thr Thr Tyr
325 330 335

Gly Tyr Thr Ala Gly Val Tyr Val Met Ile Phe Asp Cys Asn Thr Ala
340 345 350

Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Gly Asn Gly Thr Ile Ile
355 360 365

Asn Pro Arg Ser Asn Leu Val Leu Ala Ala Ser Ser Gly Ile Lys Gly
370 375 380

Thr Thr Leu Thr Val Gln Thr Leu Asp Tyr Thr Leu Gly Gln Gly Trp
385 390 395 400

Leu Ala Gly Asn Asp Thr Ala Pro Arg Glu Val Thr Ile Tyr Gly Phe
405 410 415

Arg Asp Leu Cys Met Glu Ser Asn Gly Gly Ser Val Trp Val Glu Thr
420 425 430

Cys Val Ser Ser Gln Gln Asn Gln Arg Trp Ala Leu Tyr Gly Asp Gly
435 440 445

Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys Leu Thr Cys Gly Arg
450 455 460

Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser Cys Ser Ala Gly Ser
465 470 475 480

Ser Gly Gln Arg Trp Val Phe Thr Asn Glu Gly Ala Ile Leu Asn Leu
485 490 495

Lys Asn Gly Leu Ala Met Asp Val Ala Gln Ala Asn Pro Lys Leu Arg
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Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro Asn Gln Met Trp Leu
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Pro Val Pro
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 20 25 30
 Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln Ser Thr Ile Pro Val Ser
 35 40 45
 Asp Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Gln Asp
 50 55 60
 Ser Ile Thr Ala Ala Ile Asp Val Thr Asn Ala Tyr Val Val Ala Tyr
 65 70 75 80
 Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala
 85 90 95
 Glu Thr His Leu Phe Thr Gly Thr Thr Arg Asp Arg Ser Ser Leu Pro
 100 105 110
 Phe Thr Gly Ser Tyr Thr Asp Leu Glu Arg Tyr Ala Gly His Arg Asp
 115 120 125
 Gln Ile Pro Leu Gly Ile Glu Gln Leu Ile Gln Ser Val Ser Ala Leu
 130 135 140
 Arg Tyr Pro Gly Gly Ser Thr Arg Ala Gln Ala Arg Ser Ile Leu Ile
 145 150 155 160
 Leu Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp
 165 170 175
 Arg Tyr Arg Gln Asp Ile Asn Ser Gly Glu Ser Phe Leu Pro Asp Met
 180 185 190
 Tyr Met Leu Glu Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val
 195 200 205
 Gln His Ser Thr Asp Gly Val Phe Asn Asn Pro Phe Arg Leu Ala Ile
 210 215 220
 Ser Thr Gly Asn Phe Val Thr Leu Ser Asn Val Arg Ser Val Ile Ala
 225 230 235 240
 Ser Leu Ala Ile Met Leu Phe Val Cys Gly Glu Arg Pro Ser Ser Ser
 245 250 255

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Asp Asp Val Thr Cys Ser Ala Ser Glu Pro Thr Val Arg Ile Val Gly
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 Arg Asn Gly Met Cys Val Asp Val Arg Asp Asp Asp Phe His Asp Gly
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Asn Gln Ile Gln Leu Trp Pro Ser Lys Ser Asn Asn Asp Pro Asn Gln
 35 40 45
 Leu Trp Thr Ile Lys Arg Asp Gly Thr Ile Arg Ser Asn Gly Ser Cys
 50 55 60
 Leu Thr Thr Tyr Gly Tyr Thr Ala Gly Val Tyr Val Met Ile Phe Asp
 65 70 75 80
 Cys Asn Thr Ala Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Gly Asn
 85 90 95
 Gly Thr Ile Ile Asn Pro Arg Ser Asn Leu Val Leu Ala Ala Ser Ser
 100 105 110
 Gly Ile Lys Gly Thr Thr Leu Thr Val Gln Thr Leu Asp Tyr Thr Leu
 115 120 125
 Gly Gln Gly Trp Leu Ala Gly Asn Asp Thr Ala Pro Arg Glu Val Thr
 130 135 140
 Ile Tyr Gly Phe Arg Asp Leu Cys Met Glu Ser Asn Gly Gly Ser Val
 145 150 155 160
 Trp Val Glu Thr Cys Val Ser Ser Gln Gln Asn Gln Arg Trp Ala Leu
 165 170 175
 Tyr Gly Asp Gly Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys Leu
 180 185 190
 Thr Cys Gly Arg Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser Cys
 195 200 205
 Ser Ala Gly Ser Ser Gly Gln Arg Trp Val Phe Thr Asn Glu Gly Ala
 210 215 220
 Ile Leu Asn Leu Lys Asn Gly Leu Ala Met Asp Val Ala Gln Ala Asn
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 Gln Met Trp Leu Pro Val Pro
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Asn Gln Ile Gln Leu Trp Pro Ser Lys Ser Asn Asn Asp Pro Asn Gln
 35 40 45
 Leu Trp Thr Ile Lys Arg Asp Gly Thr Ile Arg Ser Asn Gly Ser Cys
 50 55 60
 Leu Thr Thr Tyr Gly Tyr Thr Ala Gly Val Tyr Val Met Ile Phe Asp
 65 70 75 80
 Cys Asn Thr Ala Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Asp Asn
 85 90 95
 Gly Thr Ile Ile Asn Pro Arg Ser Asn Leu Val Leu Ala Ala Ser Ser
 100 105 110
 Gly Ile Lys Gly Thr Thr Leu Thr Val Gln Thr Leu Asp Tyr Thr Leu
 115 120 125
 Gly Gln Gly Trp Leu Ala Gly Asn Asp Thr Ala Pro Arg Glu Val Thr
 130 135 140
 Ile Tyr Gly Phe Arg Asp Leu Cys Met Glu Ser Asn Gly Gly Ser Val
 145 150 155 160
 Trp Val Glu Thr Cys Asp Ser Ser Gln Lys Asn Gln Gly Lys Trp Ala
 165 170 175
 Leu Tyr Gly Asp Gly Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys
 180 185 190
 Leu Thr Ser Gly Arg Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser
 195 200 205
 Cys Ser Gly Ala Ser Gly Ser Gln Arg Trp Val Phe Thr Asn Glu Gly
 210 215 220
 Ala Ile Leu Asn Leu Lys Asn Gly Leu Ala Met Asp Val Ala Gln Ala
 225 230 235 240
 Asn Pro Lys Leu Arg Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro
 245 250 255
 Asn Gln Met Trp Leu Pro Val Phe
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Asp Asp Val Thr Cys Ser Ala Ser Glu Pro Thr Val Arg Ile Val Gly
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 Arg Ser Gly Met Arg Val Asp Val Arg Asp Asp Asp Phe His Asp Gly
 20 25 30

Asn Gln Ile Gln Leu Trp Pro Ser Lys Ser Asn Asn Asp Pro Asn Gln
 35 40 45
 Leu Trp Thr Ile Lys Arg Asp Asn Thr Ile Arg Ser Asn Gly Ser Cys
 50 55 60
 Leu Thr Thr Tyr Gly Tyr Thr Ala Gly Val Tyr Val Met Ile Phe Asp
 65 70 75 80
 Cys Asn Thr Ala Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Asp Asn
 85 90 95
 Gly Thr Ile Ile Asn Pro Arg Ser Asn Leu Val Leu Ala Ala Ser Ser
 100 105 110
 Gly Ile Lys Gly Thr Thr Leu Thr Val Gln Thr Leu Asp Tyr Thr Leu
 115 120 125
 Gly Gln Gly Trp Leu Ala Gly Asn Asp Thr Ala Pro Arg Glu Val Thr
 130 135 140
 Ile Tyr Gly Phe Arg Asp Leu Cys Met Glu Ser Asn Gln Gly Ser Val
 145 150 155 160
 Trp Val Glu Thr Cys Asp Ser Ser Gln Lys Asn Gln Gly Lys Trp Ala
 165 170 175
 Leu Tyr Gly Asp Gly Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys
 180 185 190
 Leu Thr Val Gly Arg Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser
 195 200 205
 Cys Ser Gly Ala Ser Gly Ser Gln Arg Trp Val Phe Thr Asn Glu Tyr
 210 215 220
 Ala Ile Leu Asn Leu Lys Ser Gly Leu Ala Met Asp Val Ala Gln Ala
 225 230 235 240
 Asn Pro Lys Leu Arg Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro
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 Asn Gln Ile Gln Leu Trp Pro Ser Lys Ser Asn Asn Asp Pro Asn Gln
 35 40 45

Leu Trp Thr Ile Lys Arg Asp Gly Thr Ile Arg Ser Asn Gly Ser Cys
 50 55 60
 Leu Thr Thr Tyr Gly Tyr Thr Ala Gly Val Tyr Val Met Ile Phe Asp
 65 70 75 80
 Cys Asn Thr Ala Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Asp Asn
 85 90 95
 Gly Thr Ile Ile Asn Pro Arg Ser Asn Leu Val Leu Ala Ala Ser Ser
 100 105 110
 Gly Ile Lys Gly Thr Thr Leu Thr Val Gln Thr Leu Asp Tyr Thr Leu
 115 120 125
 Gly Gln Gly Trp Leu Ala Gly Asn Asp Thr Ala Pro Arg Glu Val Thr
 130 135 140
 Ile Tyr Gly Phe Arg Asp Leu Cys Met Glu Ser Asn Gly Gly Ser Val
 145 150 155 160
 Trp Val Glu Thr Cys Asp Ser Ser Gln Lys Asn Gln Gly Lys Trp Ala
 165 170 175
 Leu Tyr Gly Asp Gly Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys
 180 185 190
 Leu Thr Ser Gly Arg Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser
 195 200 205
 Cys Ser Gly Ala Ser Gly Ser Gln Arg Trp Val Phe Thr Asn Glu Gly
 210 215 220
 Ala Ile Leu Asn Leu Lys Thr Gly Leu Ala Met Asp Val Ala Gln Ala
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Asn Pro Lys Leu Arg Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro
 245 250 255

Asn Gln Met Trp Leu Pro Val Phe
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 <400> 10

Asp Asp Val Thr Cys Ser Ala Ser Glu Pro Thr Val Arg Ile Val Gly
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 Arg Asn Gly Met Arg Val Asp Val Arg Asp Asp Asp Phe His Asp Gly
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 Asn Gln Ile Gln Leu Trp Pro Ser Lys Ser Asn Asn Asp Pro Asn Gln
 35 40 45

Leu Trp Thr Ile Lys Arg Asp Gly Thr Ile Arg Ser Asn Gly Ser Cys
 50 55 60
 Leu Thr Thr Tyr Gly Tyr Thr Ala Gly Val Tyr Val Met Ile Phe Asp
 65 70 75 80
 Cys Asn Thr Ala Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Asp Asn
 85 90 95
 Gly Thr Ile Ile Asn Pro Arg Ser Asn Leu Val Leu Ala Ala Ser Ser
 100 105 110
 Gly Ile Lys Gly Thr Thr Leu Thr Val Gln Thr Leu Asp Tyr Thr Leu
 115 120 125
 Gly Gln Gly Trp Leu Ala Gly Asn Asp Thr Ala Pro Arg Glu Val Thr
 130 135 140
 Ile Tyr Gly Phe Arg Asp Leu Cys Met Glu Ser Asn Gly Gly Ser Val
 145 150 155 160
 Trp Val Glu Thr Cys Asp Ser Ser Gln Lys Asn Gln Gly Lys Trp Ala
 165 170 175
 Leu Tyr Gly Asp Gly Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys
 180 185 190
 Leu Thr Ser Gly Arg Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser
 195 200 205
 Cys Ser Gly Ala Ser Gly Ser Gln Arg Trp Val Phe Thr Asn Glu Gly
 210 215 220
 Ala Ile Leu Asn Leu Lys Lys Gly Pro Ala Met Asp Val Ala Gln Ala
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 245 250 255
 Asn Gln Met Trp Leu Pro Val Phe
 260

<210> 11
 <211> 264
 <212> PRT
 <213> Artificial
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 <223> mistletoe lectin B5 (match)
 <400> 11

Asp Asp Val Thr Cys Ser Ala Ser Glu Pro Thr Val Arg Ile Val Gly
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 Asn Gln Ile Gln Leu Trp Pro Ser Lys Ser Asn Asn Asp Pro Asn Gln
 35 40 45

Leu Trp Thr Ile Lys Arg Asp Gly Thr Ile Arg Ser Asn Gly Ser Cys
 50 55 60
 Leu Thr Thr Tyr Gly Tyr Thr Ala Gly Val Tyr Val Met Ile Phe Asp
 65 70 75 80
 Cys Asn Thr Ala Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Asp Asn
 85 90 95
 Gly Thr Ile Ile Asn Pro Arg Ser Asn Leu Val Leu Ala Ala Ser Ser
 100 105 110
 Gly Ile Lys Gly Thr Thr Leu Thr Val Gln Thr Leu Asp Tyr Thr Leu
 115 120 125
 Gly Gln Gly Trp Leu Ala Gly Asn Asp Thr Ala Pro Arg Glu Val Thr
 130 135 140
 Ile Tyr Gly Phe Arg Asp Leu Cys Met Glu Ser Asn Gly Gly Ser Val
 145 150 155 160
 Trp Val Glu Thr Cys Asp Ser Ser Gln Lys Asn Gln Gly Lys Trp Ala
 165 170 175
 Leu Tyr Gly Asp Gly Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys
 180 185 190
 Leu Thr Ser Gly Arg Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser
 195 200 205
 Cys Ser Gly Ala Ser Gly Ser Gln Arg Trp Val Phe Thr Asn Glu Gly
 210 215 220
 Ala Ile Leu Asn Leu Lys Asn Ser Leu Met Val Asp Val Ala Gln Ala
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 245 250 255
 Asn Gln Met Trp Leu Pro Val Phe
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 <211> 1598
 <212> DNA
 <213> Artificial

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 <223> ML-I

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 <220>
 <221> misc_feature
 <222> 1322
 <223> product= "n is ggc or missing"
 /label= Z2

<400>

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caggggsrrg actcgrtyac ggccgccatc gacgttacca atsyktacgt cgtggcttac 240
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cgkskkskca gcgatgggtg tttaccaatg aakrsgccat tttgaattta aagavwrgsy 1500
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<210>

13

<211>

763

<212>

DNA

<213>

Artificial

<220>

<223> MLA
 <220>
 <221> misc_feature
 <222> 319
 <223> product= "n is gat aga or missing"
 /label= z1

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 cgtcagtcta cgatccccgt ctccgatgcg caaagatttg tcttggtgga gtcaccaac 180
 caggggsrrg actcgrtyac ggccgccatc gacgttacca atsytacgt cgtggcttac 240
 caagcaggcg accaatccta ctttttgccg gacgcaccac gcggcgcgga aacgcacctc 300
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 kgcgcttcgt twyccggggc gcagcacgcg tccycaagct cgttcgattt taatcctcat 480
 tcagatgatc tccgaggccg ccagattcaa tccatctta tggaggkmyc gccakayat 540
 taacagtggg gmrtcatttc tgccagacrt gtaeatgctg gagctggaga cgagttgggg 600
 ccaacaatcc acgcaagtcc agcattcaac cgttgccgtt ttaataacc cawtycggtt 660
 ggctataycy mcyggtaact tcgtgacgtt gwcyaatgtt cgckmygtga tcgccagctt 720
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<210> 14
 <211> 793
 <212> DNA
 <213> Artificial

<220>
 <223> MLB

 <220>
 <221> misc_feature
 <222> 517
 <223> product= "n is ggc or missing"
 /label= Z2

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 aagtccaaca atgatccgga tcagttgtgg acgatcaaaa gggatrrmac cattcgatcc 180
 aatggcagct gcttgaccac gtatggctat actgctggcg tctatgtgat gatcttcgac 240
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cgcgagggtga ccatatatgg tttcagggac ctttgcattg aatcaaatsr agggagtgtg	480
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aacagtaatc aatatagtta gctgcagcgs wgswtcgksk kskcagcagat ggggtgtttac	660
caatgaakrs gccattttga atttaaagav wrgsyygrys rtggatgtgg cgcaagcaaa	720
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tcccgtgyym tga	793

<210> 15
 <211> 1596
 <212> DNA
 <213> Artificial

<220>
 <223> MLA-I

<400> 15

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cgtcagtcta cgatccccgt ctccgatgcg cgaagatttg tcttggtgga gctcaccaac	180
caggggggag actcgatcac ggccgccatc gacgtttacca atctgtacgt cgtggcttac	240
caagcaggcg accaatccta ctttttgcgc gacgcaccac gcggcgcgga aacgcacctc	300
ttcacgggca ccaccgata ctctctcca ttcaacggaa gctaccctga tctggagcga	360
tacgccggac atagggacca gatccctctc ggtatagacc aactcattca atccgtcacg	420
gcgcttcggt ttccgggcgg cagcacgcgt acccaagctc gttcgatttt aatcctcatt	480
cagatgatct ccgaggccgc cagattcaat cccatcttat ggagggctcg ccaatacatt	540
aacagtgggg cgtcattttc gccagacgtg tacatgctgg agctggagac gagttggggc	600
caacaatcca cgcaagtcca gcattcaacc gatggcggtt ttaataacct aattcggttg	660
gctatacccc ccgtaactt cgtgacgttg accaatgttc gcgacgtgat cgccagcttg	720
gogatcatgt tgtttgatg cggagagcgg ccattcttct ctgacgtgcg ctattggccg	780
ctggtcatac gaccctgat agccgatgat gttacctgca gtgcttcgga acctacggtg	840
cggattgtgg gtcgaaatgg catgtgcgtg gacgtccgag atgacgattt ccacgatggg	900
aatcagatac agttgtggcc ctccaagtcc aacaatgate cgaatcagtt gtggaagatc	960
aaaagggatg gaaccattcg atccaatggc agctgcttga ccacgtatgg ctatactgct	1020

ggcgctctatg tgatgatctt cgactgtaat actgctgtgc gggaggccac tatttggcag 1080
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 gccatggatg tggcgcaagc aaatccaaag ctccgcgaa taattatcta tctgccaca 1560
 ggaaaaccaa atcaaatgtg gcttcccggtg ccatga 1596

<210> 16
 <211> 762
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin A1

<460> 16

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 cgtcagtccta cgatccccgt ctccgatgag caaagatttg tcttggtgga gctcaccaac 180
 caggggcagg actcgggttac ggccgcacac gacgttacca atgcttacgt cgtggcttac 240
 caagcaggcg accaatccta ctttttgcgc gacgcaccac gcggcgcgga aacgcacctc 300
 ttcaccggca ccaccogac ctctctccca ttcaacggaa gctaccctga tctggagcga 360
 tacgccggac atagggacca gatccctctc ggtatagacc aactcattca atccgtcacg 420
 gcgcttcggt ttcggggcgg cagcacgcgt acccaagctc gttcgatttt aatcctcatt 480
 cagatgatct ccgaggccgc cagattcaat cccatcttat ggaggtacgg ccaatacatt 540
 aacagtgggg cgtcatttct gccagacgtg tacatgctgg agctggagac gagttggggc 600
 caacaatcca cgcaagtcca gcattcaacc gatggcgttt ttaataaccc aattcggttg 660
 gctatacccc ccggtaaact cgtgacgttg accaatgttc gcgacgtgat cgccagcttg 720
 gcgatcatgt tgtttgtatg cggagagcgg ccatcttccct ct 762

<210> 17
 <211> 768
 <212> DNA
 <213> Artificial

<220>
<223> mistletoe lectin A2

<400> 17

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cgtcagtcta cgatccccgt ctccgatgcg caaagatttg tcttggtgga gtcaccaac	180
caggggcagg actcgatcac ggccgccatc gacgttacca atgcttacgt cgtggcttac	240
caagcaggcg accaatccta ctttttgccg gacgcaccac gcggcgcgga aacgcacctc	300
ttcacccggca ccaccgaga tagatcctct ctcccattca ctggaagcta caccgatctg	360
gagcgatacg ccggacatag ggaccagatc cctctcggtt tagagcaact cattcaatcc	420
gtctctgcgc ttcgttaccc gggcggcagc acgcgtgctc aagctcgttc gattttaatc	480
ctcattcaga tgatctccga ggccgccaga ttcaatccca tcttatggag gtaccgcaa	540
gatattaaca gtggggaatc atttctgccg gacatgtaca tgctggagct ggagacgagt	600
tggggccaac aatccacgca agtccagcat tcaaccgatg gcgtttttaa taaccattc	660
cggttggtta tatctactgg taacttcgtg acgttctcta atgttcgctc tgtgatcgcc	720
agcttggcga tcatgttggt tgtatgcgga gacggyccat ctctctct	768

<210> 18
<211> 1596
<212> DNA
<213> Artificial

<220>
<223> MLI (matched)

<400> 18

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agacaatcta ctattccagt ttctgatgct cagcgtttcg ttcttggtga attgactaac	180
caaggagggtg atagtattac tgctgctatt gatgtgacta acctttatgt tgttgcatat	240
caggctgggtg atcagttctta ttctcttagg gatgctccta yaggagctga gactcatttg	300
tttactggta caacacggag ttctttgcct tttaacgggt cttatccaga cttggaaaga	360
tatgctggtc acagagatca aattccattg ggaattgata agttgatcca gagtgttact	420
gctttgagat tcccagggtg atctactaga acacaggcaa gatctatcct tattttgatc	480
caaagatta gtgaagctgc taggtttaac cctattcttt ggagagcaag acagtatatc	540
aactctgggtg cttctttctt tctgatgtt tatatgcttg aacttgaaac ttcattggga	600
cagcagtcta ctcagggtta acacagtaca gacggtgtgt tcaacaatcc tatcagactt	660

gcaattccac ctggaaatth tggtactctt acaaactga gagatgttat tgcttctctt	720
gctattatgc ttttcgtttg tggatgaaaga cttctagtt ctgatgttag atactggcca	780
ttggttatta ggctgttat cgctgacgat gtgacatgtt ctgcatctga accaactgtt	840
aggatcggtg gaagaaacgg tatgtgtgtt gatgttcggg acgatgactt tcatgacgg	900
aaccaaactcc aactttggcc tagtaagtct aataacgacc caaaccaact ttggactatt	960
aagagagacg gtacaatcag gtctaacgga tcttgtctta ctacatacgg ttacactgca	1020
ggagtttacg ttatgatttt tgattgcaac acagcagtta gagaagctac aatctggcaa	1080
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<210>	19
<211>	762
<212>	DNA
<213>	Artificial

<220>	
<223>	mistletoe lectin A1

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agacaatcta ctattccagt ttctgatgct cagcgtttcg ttcttggtga attgactaac	180	
caaggacagg atagtgttac tcttgctatt gatgtgacta acgcttatgt tgttgcatat	240	
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tttactggta caacacggag ttctttgctt tttaacgggtt cttatccaga cttggaaaga	360	
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caaatgatta gtgaagctgc taggtttaac cctattcttt ggagatacag acagtatatc	540	
aactctggtg cttctttctt tcttgatgtt tatatgcttg aacttgaaac ttcattggga	600	

cagcagteta ctcaggttca acacagtaca gaggggtgtgt tcaacaatcc tatcagactt 660
gcaattccac ctggaaattt tgttactctt acaaacgtga gagatgttat tgcttctctt 720
gctattatgc ttttcgtttg tggtgaaaga ccttctagtt ct 762

<210> 20
<211> 768
<212> DNA
<213> Artificial

<220>
<223> mistletoe lectin A2

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agacaatcta ctattccagt ttctgatgct cagcgtttcg ttcttggtga attgactaac 180
caaggacagg atagtattac tgctgctatt gatgtgacta acgcttatgt tgttgcatat 240
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gtttctgctt tgagataccc aggtggatct actagagctc aggcaagatc tatccttatt 480
ttgatccaaa tgattagtga agctgctagg tttaacctta ttctttggag atacagacag 540
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tggggacagc agtctactca ggttcaacac agtacagacg gtgtgttcaa caatcctttc 660
agacttgcaa tttctactgg aaattttgtt actctttcta acgtgagatc tgttattgct 720
tctcttgcta ttatgctttt cgtttggtgt gaaagacctt ctagttct 768

<210> 21
<211> 792
<212> DNA
<213> Artificial

<220>
<223> mistletoe lectin B

<400> 21
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aatggcagct gcttgaccac gtatggctat actgctggcg tctatgtgat gatcttcgac 240
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aatccaagat ccaatctggt tttggcagca tcatctggaa tcaaaggcac tacgcttacg	360
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cgcgagggtga ccatatatgg tttcaggagac ctttgcattg aatcaaattg agggagtgtg	480
tgggtggaga cgtgcgtgag tagccaacag aaccaagat gggctttgta cggggatggt	540
tctatacgcc ccaaacaaaa ccaagaccaa tgcctcacct gtgggagaga ctccgtttca	600
acagtaatca atatagttag ctgcagcgtt ggatcgtctg ggcagcgatg ggtgtttacc	660
aatgaagggg ccattttgaa tttaaagaat ggggtggcca tggatgtggc gcaagcaa	720
ccaaagctcc gccgaataat tatctatcct gccacaggaa aaccaaata aatgtggctt	780
cccgtgccat ga	792

<210> 22
 <211> 795
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin B1

<400> 22

gatgatgtta cctgcagtgc ttcggaacct acggtgcgga ttgtgggtcg aaatggcatg	60
cgctgggacg tccgagatga cgatttcac gatgggaatc agatacagtt gtggccctcc	120
aagtccaaca atgatccgaa tcagttgtgg acgatcaaaa gggatggaac cattcgatcc	180
aatggcagct gcttgaccac gtatggctat actgctggcg tctatgtgat gatcttcgac	240

tgtataactg ctgtgcggga ggccactatt tggcagatat gggacaatgg gaccatcacc	300
aatccaagat ccaatctggt tttggcagca tcatctggaa tcaaaggcac tacgcttacg	360
gtgcaaacac tggattacac gttgggacag ggctggcttg ccggtaatga taccgccccca	420
cgcgagggtga ccatatatgg tttcaggagac ctttgcattg aatcaaattg agggagtgtg	480
tgggtggaga cgtgcgacag tagccaaaag aaccaaggca aatgggcttt gtacggggat	540
ggttctatac gccccaaaca aaaccaagac caatgcctca cctctgggag agactccgtt	600
tcaacagtaa tcaatatagt tagctgcagc ggagcttcgg ggtctcagcg atgggtgttt	660
accaatgaag gggccatttt gaatttaaag aatgggttgg ccattgatgt ggcgcaagca	720
aatccaaagc tccgccgaat aattatctat cctgccacag gaaaacaaa tcaaatgtgg	780
cttcccgtgt tctga	795

<210> 23
 <211> 795
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin B2
 <400> 23

gatgatgtta cctgcagtgc ttcggaacct acggtgcgga ttgtgggtcg aagtggcatg	60
cgcgtggacg tccgagatga cgatttccac gatgggaatc agatacagtt gtggccctcc	120
aagtccaaca atgatccgaa tcagttgtgg acgatcaaaa gggataaacac cattcgatcc	180
aatggcagct gcttgaccac gtatggctat actgctggcg tctatgtgat gatcttcgac	240
tgtaatactg ctgtgcgga ggccactatt tggcagatat gggacaatgg gaccatcatc	300
aatccaagat ccaatctggt tttggcagca tcatctggaa tcaaaggcac tacgcttacg	360
gtgcaaacac tggattacac gttgggacag ggctggcttg ccggtaatga taccgcccc	420
cgcgaggtga ccatatatgg tttcagggac ctttgcattg aatcaaatca agggagtgtg	480
tgggtggaga cgtgcgacag tagccaaaag aaccaaggca aatgggcttt gtacggggat	540
ggttctatac gcccacaaca aaaccaagac caatgcctca ccgttgggag agactccgtt	600
tcaacagtaa tcaatatagt tagctgcagc ggagcttcgg ggtctcagcg atgggtgttt	660
accaatgaat acgccatttt gaatttaaag agtgggttgg ccatggatgt ggcgcaagca	720
aatccaaagc tccgccgaat aattatctat cctgccacag gaaaaccaa tcaaatgtgg	780
cttcccgtgt tctga	795

<210> 24
 <211> 795
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin B3
 <400> 24

gatgatgtta cctgcagtgc ttcggaacct acggtgcgga ttgtgggtcg aaatggcatg	60
cgcgtggacg tccgagatga cgatttccac gatgggaatc agatacagtt gtggccctcc	120
aagtccaaca atgatccgaa tcagttgtgg acgatcaaaa gggatggaaac cattcgatcc	180
aatggcagct gcttgaccac gtatggctat actgctggcg tctatgtgat gatcttcgac	240
tgtaatactg ctgtgcgga ggccactatt tggcagatat gggacaatgg gaccatcatc	300
aatccaagat ccaatctggt tttggcagca tcatctggaa tcaaaggcac tacgcttacg	360
gtgcaaacac tggattacac gttgggacag ggctggcttg ccggtaatga taccgcccc	420
cgcgaggtga ccatatatgg tttcagggac ctttgcattg aatcaaatgg agggagtgtg	480
tgggtggaga cgtgcgacag tagccaaaag aaccaaggca aatgggcttt gtacggggat	540
ggttctatac gcccacaaca aaaccaagac caatgcctca cctctgggag agactccgtt	600

tcaacagtaa tcaatatagt tagctgcagc ggagcttcgg ggtctcagcg atgggtgttt	660
accaatgaag gggccatttt gaatttaaag actgggttgg ccatggatgt ggcgcaagca	720
aatccaaagc tccgccgaat aattatctat cctgccacag gaaaaccaa tcaaatgtgg	780
cttcccgtgt tctga	795

<210> 25
 <211> 795
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin B4

<400> 25

gatgatgtta cctgcagtgc ttcggaacct acggtgcgga ttgtgggtcg aaatggcatg	60
cgcgtggacg tccgagatga cgatttccac gatgggaatc agatacagtt gtggccctcc	120
aagtccaaca atgatccgaa tcagttgtgg acgatcaaaa gggatggaac cattcgatcc	180
aatggcagct gcttgaccac gtatggatat actgctggcg tctatgtgat gatcttcgac	240
tgtaatactg ctgtgoggga ggccactatt tggcagatat gggacaatgg gaccatcacc	300
aatccaagat ccaatctggt tttggcagca tcactctgga tcaaaggcac tacgcttacg	360
gtgcaaacac tggattacac gttgggacag ggctggcttg ccggtaatga taccgcccc	420
cgcgaggtga ccatatatgg ttccaggac ctttgcattg aatcaaattg agggagtgtg	480
tgggtggaga cgtgcgacag tagccaaaag aaccaaggca aatgggcttt gtacggggat	540

ggttctatac gccccaaaac aaaccaagac caatgcctca cctctgggag agactccgtt	600
tcaacagtaa tcaatatagt tagctgcagc ggagcttcgg ggtctcagcg atgggtgttt	660
accaatgaag gggccatttt gaatttaaag aaagggccgg ccatggatgt ggcgcaagca	720
aatccaaagc tccgccgaat aattatctat cctgccacag gaaaaccaa tcaaatgtgg	780
cttcccgtgt tctga	795

<210> 26
 <211> 795
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin B5

<400> 26

gatgatgtta cctgcagtgc ttcggaacct acggtgcgga ttgtgggtcg aaatggcatg	60
cgcgtggacg tccgagatga cgatttccac gatgggaatc agatacagtt gtggccctcc	120
aagtccaaca atgatccgaa tcagttgtgg acgatcaaaa gggatggaac cattcgatcc	180

aatggcagct gcttgaccac gtatggctat actcctggcg tctatgtgat gatcttcgac	240
tgtaatactg ctgtgcgga ggccactatt tggcagatat gggacaatgg gaccatcatc	300
aatccaagat ccaatctggt tttggcagca tcatctggaa tcaaaggcac tacgcttacg	360
gtgcaaacac tggattacac gttgggacag ggctggcttg ccggtaatga taccgcccc	420
cgcgaggtga ccatatatgg tttcagggac ctttgcattg aatcaaattg agggagtgtg	480
tgggtggaga cgtgcgacag tagccaaaag aaccaaggca aatgggcttt gtacggggat	540
ggttctatac gcccacaaac aaaccaagac caatgectca cctctgggag agactccgtt	600
tcaacagtaa tcaatatagt tagctgcagc ggagcttcgg ggtctcagcg atgggtgttt	660
accaatgaag gggccatttt gaatttaaag aatagcttga tgggtgatgt ggcgcaagca	720
aatccaaagc tccgccgaat aattatctat cctgccacag gaaaaccaa tcaaatgtgg	780
cttcccgtgt tctga	795

<210>	27
<211>	792
<212>	DNA
<213>	Artificial
<220>	
<223>	mistletoe lectin B
<400>	27

gacgatgtga catgttctgc atctgaacca actgcttagga tgggttgaag aaacggtatg	60
tgtgttgatg ttcggggacga tgactttcat gacgtaacc aatccaact ttggcctagt	120
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aagtctaata acgacccaaa ccaactttgg actattaaga gagacggtac aatcaggtct	180
aacggatctt gtcttactac atacggttac actgcaggag ttacgttat gatttttgat	240
tgcaacacag cagttagaga agctacaatc tggcaaatct ggggtaacgg aactattatt	300
aaccctcgtt ctaacttggg gcttgctgct tctagtggta ttaagggaac aactttgact	360
gttcagactt tggactatac tcttgggtcaa ggatgggttg ctggaaacga cacagctcct	420
agagaagtta caatctacgg atttagagat ttgtgtatgg agtctaacgg tggatctgtt	480
tgggttgaaa cttgtgtttc atctcagcaa aatcagaggt gggcacttta tggtgacgga	540
agtatcagac ctaagcagaa tcaggatcag tgtttgacat gcggtaggga tagtgtgtct	600
actgttatta acattgtgtc ttgttctgca ggtagtcttg gacaaagggt ggttttcaca	660
aacgaggggtg ctatccttaa cttgaagaac ggtcttgcta tggatgttgc tcaggctaac	720
cctaagttga gaaggattat catttaccga gctactggta agcctaacca gatgtgggtg	780
ccagttcctt at	792

<210>	28
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<211> 795
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin 1 (match)

<400> 28

gacgatgtga catgttctgc atctgaacca actgttagga tegtgggaag aaacgggatg	60
cgtgttgatg ttcgggacga tgactttcat gacggtaacc aaatccaact ttggcctagt	120
aagtctaata acgacccaaa ccaactttgg actattaaga gagacggtag aatcaggctt	180
aacggatctt gtcttactac atacggttac actgcaggag tttagcttat gatttttgat	240
tgcaacacag cagttagaga agctacaatc tggcaaatct gggataacgg aactattatt	300
aaccctcggt ctaacttggg gcttgctgct tctagtggta ttaagggaac aactttgact	360
gttcagactt tggactatac tcttgggtcaa ggatgggttg ctggaaacga cacagctcct	420
agagaagtta caatctacgg atttagagat ttgtgtatgg agtctaacgg tggatctggt	480
tgggttgaaa cttgtgattc atctcagaaa aatcagggca agtgggcact ttatgggtgac	540
ggaagtatca gacctaagca gaatcaggat cagtgtttga catccggtag ggatagtgtg	600
tctactgtta ttaacattgt gtcttgttct ggagctagtg gatctcaaag gtgggttttc	660
acaaacgagg gtgctatcct taacttgaag aacggctctg ctatggatgt tgctcaggct	720
aaccttaagt tgagaaggat tatcatttac ccagctactg gtaagcctaa ccagatgtgg	780
ttgccagttt tttat	795

<210> 29
 <211> 795
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin B2 (match)

<400> 29

gacgatgtga catgttctgc atctgaacca actgttagga tegtgggaag aacgggatg	60
cgtgttgatg ttcgggacga tgactttcat gacggtaacc aaatccaact ttggcctagt	120
aagtctaata acgacccaaa ccaactttgg actattaaga gagacaatac aatcaggctt	180
aacggatctt gtcttactac atacggttac actgcaggag tttagcttat gatttttgat	240
tgcaacacag cagttagaga agctacaatc tggcaaatct gggataacgg aactattatt	300
aaccctcggt ctaacttggg gcttgctgct tctagtggta ttaagggaac aactttgact	360
gttcagactt tggactatac tcttgggtcaa ggatgggttg ctggaaacga cacagctcct	420
agagaagtta caatctacgg atttagagat ttgtgtatgg agtctaacca gggatctggt	480

tgggttgaaa cttgtgattc atctcagaaa aatcagggca agtgggcact ttatggtgac 540
 ggaagtatca gacctaagca gaatcaggat cagtgtttga cagtcggtag ggatagtgtg 600
 tctactgtta ttaacattgt gtcttgttct ggagctagtg gatctcaaag gtgggttttc 660
 acaaacgagt atgctatcct taacttgaag tccggtcttg ctatggatgt tgctcaggct 720
 aaccctaagt tgagaaggat tatcatttac ccagctactg gtaagcctaa ccagatgtgg 780
 ttgccagttt tttat 795

<210> 30
 <211> 795
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin B3 (match)

<400> 30

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 cgtgttgatg ttcgggacga tgactttcat gacggtaacc aaatccaact ttggcctagt 120
 aagtctaata acgacccaaa ccaactttgg actattaaga gagacggtac aatcaggtct 180
 aacggatctt gtcttactac atacggttac actgcaggag ttacgttat gatttttgat 240
 tgcaacacag cagttagaga agctacaatc tggcaaactc gggataacgy aactattatt 300
 aacgctcggt ctaacttggg gcttgctgct tctagtggta ttaagggaac aactttgact 360
 gttcagactt tggactatac tcttgggtcaa ggaagggttg ctggaaacga cacagctcct 420

agagaagtta caatctacgg atttagagat ttgtgtatgg agtctaacgg tggatctggt 480
 tgggttgaaa cttgtgattc atctcagaaa aatcagggca agtgggcact ttatggtgac 540
 ggaagtatca gacctaagca gaatcaggat cagtgtttga catccggtag ggatagtgtg 600
 tctactgtta ttaacattgt gtcttgttct ggagctagtg gatctcaaag gtgggttttc 660
 acaaacgagg gtgctatcct taacttgaag accggtcttg ctatggatgt tgctcaggct 720
 aaccctaagt tgagaaggat tatcatttac ccagctactg gtaagcctaa ccagatgtgg 780
 ttgccagttt tttat 795

<210> 31
 <211> 795
 <212> DNA
 <213> Artificial

<220>
 <223> mistletoe lectin B4 (match)

<400> 31

gacgatgtga catgttctgc atctgaacca actgtagga tcgttggaag aaacggtatg 60

cgtgttgatg	ttcgggacga	tgactttcat	gacggtaacc	aaatccaact	ttggcctagt	120
aagtctaata	acgacccaaa	ccaactttgg	actattaaga	gagacggtac	aatcagggtct	180
aacggatctt	gtcttactac	atacggttac	actgcaggag	tttacgttat	gatttttgat	240
tgcaacacag	cagttagaga	agctacaatc	tggcaaactct	gggataacgg	aactattatt	300
aaccctcggt	ctaacttggg	gcttgctgct	tctagtggta	ttaagggaac	aactttgact	360
gttcagactt	tggactatac	tcttgggtcaa	ggatggttgg	ctggaaacga	cacagctcct	420
agagaagtta	caatctacgg	atttagagat	ttgtgtatgg	agtctaacgg	tggatctggt	480
tgggttgaaa	cttgtgattc	atctcagaaa	aatcagggca	agtgggcact	ttatggtgac	540
ggaagtatca	gacctaagca	gaatcaggat	cagtgtttga	catccggtag	ggatagtgtg	600
tctactgtta	ttaacattgt	gtcttgttct	ggagctagt	gatctcaaag	gtgggttttc	660
acaaacgagg	gtgctatcct	taacttgaag	aaaggtcctg	ctatggatgt	tgctcaggct	720
aaccctaagt	tgagaaggat	tatcatttac	ccagctactg	gtaagcctaa	ccagatgtgg	780
ttgccagttt	tttat					795

<210>	32
<211>	795
<212>	DNA
<213>	Artificial
<220>	
<223>	mistletoe lectin B5 (match)
<400>	32

gacgatgtga	catgttctgc	atctgaacca	actgttagga	tcgttggaag	aaacggtatg	60
cgtgttgatg	ttcgggacga	tgactttcat	gacggtaacc	aaatccaact	ttggcctagt	120
aagtctaata	acgacccaaa	ccaactttgg	actattaaga	gagacggtac	aatcagggtct	180
aacggatctt	gtcttactac	atacggttac	actgcaggag	tttacgttat	gatttttgat	240
tgcaacacag	cagttagaga	agctacaatc	tggcaaactct	gggataacgg	aactattatt	300
aaccctcggt	ctaacttggg	gcttgctgct	tctagtggta	ttaagggaac	aactttgact	360
gttcagactt	tggactatac	tcttgggtcaa	ggatggttgg	ctggaaacga	cacagctcct	420
agagaagtta	caatctacgg	atttagagat	ttgtgtatgg	agtctaacgg	tggatctggt	480
tgggttgaaa	cttgtgattc	atctcagaaa	aatcagggca	agtgggcact	ttatggtgac	540
ggaagtatca	gacctaagca	gaatcaggat	cagtgtttga	catccggtag	ggatagtgtg	600
tctactgtta	ttaacattgt	gtcttgttct	ggagctagt	gatctcaaag	gtgggttttc	660
acaaacgagg	gtgctatcct	taacttgaag	aactctctta	tgggtgatgt	tgctcaggct	720
aaccctaagt	tgagaaggat	tatcatttac	ccagctactg	gtaagcctaa	ccagatgtgg	780

ttgccagttt tttat

795

<210> 33

<211> 20

<212> DNA

<213> Artificial

<220>

<221>

<222>

<223> primer

<400> 33

gtnmgngayg aygayttyca

20

<210> 34

<211> 20

<212> DNA

<213> Artificial

<220>

<221>

<222>

<223> primer

<400> 34

atytgrttng gyttncngt

20

<210> 35

<211> 21

<212> DNA

<213> Artificial

<220>

<223> primer

<400> 35

cacagcagta ttacagtcga a

21

<210> 36

<211> 24

<212> DNA

<213> Artificial

<220>

<223> primer

<400> 36

gtctatgtga tgatcttcga ctgt

24

<210> 37

<211> 254

<212> PRT

<213> Artificial

<220>

<223> mistletoe lectin A1

<400> 37

Tyr Glu Arg Leu Arg Leu Arg Val Thr His Gln Thr Thr Gly Glu Glu
1 5 10 15

Tyr Phe Arg Phe Ile Thr Leu Leu Arg Asp Tyr Val Ser Ser Gly Ser
20 25 30

Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln Ser Thr Ile Pro Val Ser
35 40 45

Asp Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Gln Asp
50 55 60

Ser Val Thr Ala Ala Ile Asp Val Thr Asn Ala Tyr Val Val Ala Tyr
65 70 75 80

Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala
85 90 95

Glu Thr His Leu Phe Thr Gly Thr Thr Arg Ser Ser Leu Pro Phe Asn
100 105 110

Gly Ser Tyr Pro Asp Leu Glu Arg Tyr Ala Gly His Arg Asp Gln Ile
115 120 125

Pro Leu Gly Ile Asp Gln Leu Ile Gln Ser Val Thr Ala Leu Arg Phe
130 135 140

Pro Gly Gly Ser Thr Arg Thr Gln Ala Arg Ser Ile Leu Ile Leu Ile
145 150 155 160

Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp Arg Tyr
165 170 175

Arg Gln Tyr Ile Asn Ser Gly Ala Ser Phe Leu Pro Asp Val Tyr Met
180 185 190

Leu Glu Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val Gln His
195 200 205

Ser Thr Asp Gly Val Phe Asn Asn Pro Ile Arg Leu Ala Ile Pro Pro
210 215 220

Gly Asn Phe Val Thr Leu Thr Asn Val Arg Asp Val Ile Ala Ser Leu
225 230 235 240

Ala Ile Met Leu Phe Val Cys Gly Glu Arg Pro Ser Ser Ser
245 250

<210> 38
<211> 256
<212> PRT
<213> Artificial

<220>

<223> mistletoe lectin A2

<400> 38

Tyr Glu Arg Leu Arg Leu Arg Val Thr His Gln Thr Thr Gly Asp Glu
1 5 10 15

Tyr Phe Arg Phe Ile Thr Leu Leu Arg Asp Tyr Val Ser Ser Gly Ser
20 25 30

Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln Ser Thr Ile Pro Val Ser
35 40 45

Asp Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Gln Asp
50 55 60

Ser Ile Thr Ala Ala Ile Asp Val Thr Asn Ala Tyr Val Val Ala Tyr
65 70 75 80

Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala
85 90 95

Glu Thr His Leu Phe Thr Gly Thr Thr Arg Asp Arg Ser Ser Leu Pro
100 105 110

Phe Thr Gly Ser Tyr Thr Asp Leu Glu Arg Tyr Ala Gly His Arg Asp
115 120 125

Gln Ile Pro Leu Gly Ile Glu Gln Leu Ile Gln Ser Val Ser Ala Leu
130 135 140

Arg Tyr Pro Gly Gly Ser Thr Arg Ala Gln Ala Arg Ser Ile Leu Ile
145 150 155 160

Leu Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp
165 170 175

Arg Tyr Arg Gln Asp Ile Asn Ser Gly Glu Ser Phe Leu Pro Asp Met
180 185 190

Tyr Met Leu Glu Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val
195 200 205

Gln His Ser Thr Asp Gly Val Phe Asn Asn Pro Phe Arg Leu Ala Ile
210 215 220

Ser Thr Gly Asn Phe Val Thr Leu Ser Asn Val Arg Ser Val Ile Ala
225 230 235 240

Ser Leu Ala Ile Met Leu Phe Val Cys Gly Glu Arg Pro Ser Ser Ser
245 250 255

<210> 31
<211> 253
<212> PRT
<213> Artificial

<220>

<223> mistletoe lectin A1 (matched)

<400> 39

Tyr Glu Arg Leu Arg Leu Arg Val Thr His Gln Thr Thr Gly Glu Glu
1 5 10 15

Tyr Phe Arg Phe Ile Thr Leu Leu Arg Asp Tyr Val Ser Ser Gly Ser
20 25 30

Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln Ser Thr Ile Pro Val Ser
35 40 45

Asp Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Gln Asp
50 55 60

Ser Val Thr Ala Ala Ile Asp Val Thr Asn Ala Tyr Val Val Ala Tyr
65 70 75 80

Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala
85 90 95

Glu Thr His Leu Phe Thr Gly Thr Thr Arg Ser Ser Leu Pro Phe Asn
100 105 110

Gly Ser Tyr Pro Asp Leu Glu Arg Tyr Ala Gly His Arg Gln Ile Pro
115 120 125

Leu Gly Ile Asp Gln Leu Ile Gln Ser Val Thr Ala Leu Arg Phe Pro
130 135 140

Gly Gly Ser Thr Arg Thr Gln Ala Arg Ser Ile Leu Ile Leu Ile Gln
145 150 155 160

Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp Arg Tyr Arg
165 170 175

Gln Tyr Ile Asn Ser Gly Ala Ser Phe Leu Pro Asp Val Tyr Met Leu
180 185 190

Glu Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val Gln His Ser
195 200 205

Thr Asp Gly Val Phe Asn Asn Pro Ile Arg Leu Ala Ile Pro Pro Gly
210 215 220

Asn Phe Val Thr Leu Thr Asn Val Arg Asp Val Ile Ala Ser Leu Ala
225 230 235 240

Ile Met Leu Phe Val Cys Gly Glu Arg Pro Ser Ser Ser
245 250

<210> 40

<211> 534

<212> PRT

<213> Artificial

<220>

<223> mistletoe lectin

<220>

<221> SITE

<222> (15)..(15)

<223> Xaa is Asp or Glu

<220>

<221> SITE

<222> (63)..(63)

<223> Xaa is Gly or Gln

<220>

<221> SITE

<222> (66)..(66)

<223> Xaa is Ile or Val

<220>

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<222> (75)..(75)

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Tyr	Phe	Arg	Phe	Ile	Thr	Leu	Leu	Arg	Asp	Tyr	Val	Ser	Ser	Gly	Ser
			20					25						30	
Phe	Ser	Asn	Glu	Ile	Pro	Leu	Leu	Arg	Gln	Ser	Thr	Ile	Pro	Val	Ser
		35					40					45			
Asp	Ala	Gln	Arg	Phe	Val	Leu	Val	Glu	Leu	Thr	Asn	Gln	Gly	Xaa	Asp
	50					55					60				
Ser	Xaa	Thr	Ala	Ala	Ile	Asp	Val	Thr	Asn	Xaa	Tyr	Val	Val	Ala	Tyr
65					70					75					80
Gln	Ala	Gly	Asp	Gln	Ser	Tyr	Phe	Leu	Arg	Asp	Ala	Pro	Arg	Gly	Ala
				85					90					95	
Glu	Thr	His	Leu	Phe	Thr	Gly	Thr	Thr	Arg	Asp	Arg	Ser	Ser	Leu	Pro
			100					105						110	
Phe	Xaa	Gly	Ser	Tyr	Xaa	Asp	Leu	Glu	Arg	Tyr	Ala	Gly	His	Arg	Asp
		115					120					125			

Gln Ile Pro Leu Gly Ile Xaa Gln Leu Ile Gln Ser Val Xaa Ala Leu
 130 135 140
 Arg Xaa Pro Gly Gly Ser Thr Arg Xaa Gln Ala Arg Ser Ile Leu Ile
 145 150 155 160
 Leu Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp
 165 170 175
 Arg Xaa Arg Gln Xaa Ile Asn Ser Gly Xaa Ser Phe Leu Pro Asp Xaa
 180 185 190
 Tyr Met Leu Glu Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val
 195 200 205
 Gln His Ser Thr Asp Gly Val Phe Asn Asn Pro Xaa Arg Leu Ala Ile
 210 215 220
 Xaa Xaa Gly Asn Phe Val Thr Leu Xaa Asn Val Arg Xaa Val Ile Ala
 225 230 235 240
 Ser Leu Ala Ile Met Leu Phe Val Cys Gly Glu Arg Pro Ser Ser Ser
 245 250 255
 Asp Val Arg Tyr Trp Pro Leu Val Ile Arg Pro Val Ile Ala Asp Asp
 260 265 270
 Val Thr Cys Ser Ala Ser Glu Pro Thr Val Arg Ile Val Gly Arg Xaa
 275 280 285
 Gly Met Xaa Val Asp Val Arg Asp Asp Phe His Asp Gly Asn Gln
 290 295 300
 Ile Gln Leu Trp Pro Ser Lys Ser Asn Asn Asp Pro Asn Gln Leu Trp
 305 310 315 320
 Thr Ile Lys Arg Asp Xaa Thr Ile Arg Ser Asn Gly Ser Cys Leu Thr
 325 330 335
 Thr Tyr Gly Tyr Thr Ala Gly Val Tyr Val Met Ile Phe Asp Cys Asn
 340 345 350
 Thr Ala Val Arg Glu Ala Thr Ile Trp Gln Ile Trp Xaa Asn Gly Thr
 355 360 365
 Ile Ile Asn Pro Arg Ser Asn Leu Val Leu Ala Ala Ser Ser Gly Ile
 370 375 380
 Lys Gly Thr Thr Leu Thr Val Gln Thr Leu Asp Tyr Thr Leu Gly Gln
 385 390 395 400
 Gly Trp Leu Ala Gly Asn Asp Thr Ala Pro Arg Glu Val Thr Ile Tyr
 405 410 415
 Gly Phe Arg Asp Leu Cys Met Glu Ser Asn Xaa Gly Ser Val Trp Val
 420 425 430
 Glu Thr Cys Xaa Ser Ser Gln Xaa Asn Gln Xaa Xaa Trp Ala Leu Tyr
 435 440 445
 Gly Asp Gly Ser Ile Arg Pro Lys Gln Asn Gln Asp Gln Cys Leu Thr
 450 455 460

Xaa Gly Arg Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser Cys Ser
465 470 475 480

Xaa Xaa Ser Xaa Xaa Gln Arg Trp Val Phe Thr Asn Glu Xaa Ala Ile
485 490 495

Leu Asn Leu Lys Xaa Xaa Xaa Xaa Xaa Asp Val Ala Gln Ala Asn Pro
500 505 510

Lys Leu Arg Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro Asn Gln
515 520 525

Met Trp Leu Pro Val Xaa
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Tyr Glu Arg Leu Arg Leu Arg Val Thr His Gln Thr Thr Gly Xaa Glu
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Tyr Phe Arg Phe Ile Thr Leu Leu Arg Asp Tyr Val Ser Ser Gly Ser
20 25 30

Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln Ser Thr Ile Pro Val Ser
35 40 45

Asp Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Xaa Asp
50 55 60

Ser Xaa Thr Ala Ala Ile Asp Val Thr Asn Xaa Tyr Val Val Ala Tyr
65 70 75 80

Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala
85 90 95

Glu Thr His Leu Phe Thr Gly Thr Thr Arg Asp Arg Ser Ser Leu Pro
100 105 110

Phe Xaa Gly Ser Tyr Xaa Asp Leu Glu Arg Tyr Ala Gly His Arg Asp
115 120 125

Gln Ile Pro Leu Gly Ile Xaa Gln Leu Ile Gln Ser Val Xaa Ala Leu
130 135 140

Arg Xaa Pro Gly Gly Ser Thr Arg Xaa Gln Ala Arg Ser Ile Leu Ile
145 150 155 160

Leu Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp
165 170 175

Arg Xaa Arg Gln Xaa Ile Asn Ser Gly Xaa Ser Phe Leu Pro Asp Xaa
180 185 190

Tyr Met Leu Glu Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val
195 200 205

Gln His Ser Thr Asp Gly Val Phe Asn Asn Pro Xaa Arg Leu Ala Ile
210 215 220

Xaa Xaa Gly Asn Phe Val Thr Leu Xaa Asn Val Arg Xaa Val Ile Ala
225 230 235 240

Ser Leu Ala Ile Met Leu Phe Val Cys Gly Glu Arg Pro Ser Ser Ser
245 250 255

CG
conclude